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ABSTRACT

The cognitive development of 30 24-month-old children who had entered residential care before the age of four months was compared with that of 30 working class children matched for age and sex who were living at home in London. Before testing, the children's fear of strangers was rated in a standardized situation. The mean mental age of the residential nursery children was 22 months. Also in a play situation., these children vocalized less than the home children. The inferior performance of the residential children is discussed in terms of their nursery environment, their genetic potential and their limited experience with strangers. (Author/WY)

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Cognitive development of young children in residential care: A study of children aged 24-months.

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Introduction.

Spitz (1949) Goldfarb (1945) and Anna Freud's (1944) disclosures of the gross retardation that may be found in infants reared in institutions were confirmed by many subsequent workers.

Concerned by these accounts, child care authorities in England reorganised their residential nurseries, with the general aim of approximating the institutions to family life. Among the changes made were the introduction of small mixed age groups, increased staffing, and the attachment of particular staff to particular groups of children.

The studies reported below were planned to assess the effectiveness of these changes in preventing retardation in young children growing up in long stay residential nurseries. An attempt was made to control for other factors which might contribute to retardation, notably biological deficiencies in the infant and the possible trauma of separation from the mother. Accordingly, only children who had entered the institution in good physical condition before the age of four months, who were known to have been healthy full-term babies, and whose mothers had had no reported complications of pregnancy or delivery, were selected for investigation. All but one of these children were illegitimate, and their genetic status was thus to some extent unknown.

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Ideally, the effects of institutional rearing would have been studied by comparing them with children from similar backgrounds who had been fostered since early infancy. This comparison proved impossible owing to the practice of the authorities concerned of placing children for fostering after a varying and often lengthy period of institutional care. The institutional children were therefore compared with a group of children matched for age and sex living in working class families in London. The age of two years was chosen for assessment as the earliest at which an adequate amount of comprehensible verbalization was likely to be obtained. The assessment of other aspects of development is reported elsewhere. (Tizard & Tizard, in press.) Since at twenty-four months test performance may be much affected by non-cognitive ~~fac~~ factors, the child's fear of strangers was rated before testing began.

In addition to assessing the children, the institutional environment was studied and an attempt was made to quantify certain aspects of the experience of the two groups of children.

Selection of the nursery group.

The records of the three largest voluntary societies in England which provide residential care for deprived children were searched for children approaching the age of two whose medical records showed that they had been healthy full-term babies, with no complications of pregnancy or difficulties during or after delivery, who had had no subsequent illness or hospitalization, and who had entered a residential nursery in good health before the age of four months and had not been subsequently moved. The experimental group was formed of the first fifteen boys and fifteen girls located who satisfied these criteria, provided that five of the boys and five of the girls were coloured. This proviso was made because large numbers of coloured children are taken into residential care and it was wished to compare the attainments of the white and coloured children. Nine of the ten coloured children were of mixed race, with white mothers.

All but one of the institutional children were illegitimate. Half of them were visited regularly by their mothers, who hoped to care for them later, and did not wish them to be fostered meanwhile. The other half had no parental contact, and it was hoped to foster them with a view to adoption. The mean age of fostering children admitted to these institutions under the age of six months is fifteen months, hence the children who remain in residential care until 24-months are not a representative sample of those originally admitted. There is however no reason to suppose that early foster-adoptive placement is related to the I.Q. of the child or his mother: indeed, no attempt is made by the authorities concerned to make such an assessment. Considerable weight is however given to an adverse family history; of the fifteen children awaiting adoptive placement, eight were considered difficult to place because they had a parent, grandparent or uncle who had at some period been in a mental hospital, or prison, or suffered from epilepsy. In only one case was schizophrenia in question. The remaining seven children had not yet been placed because of their colour.

No I.Q. data on the parents were available, and the occupation of a quarter was unknown. One third of the mothers were in skilled white collar occupations, mostly as secretaries or bank clerks, but the proportion known to be in semi-skilled and unskilled occupations was significantly greater than that reported for women in London and South-East England in the 1961 Census, (Table.1.) This finding was confirmed in a subsequent study of 85 children in residential nurseries (Tizard & Joseph, 1970.)

The contrast group.

The files of the local health authorities in two London boroughs were searched for fifteen boys and fifteen girls approaching the age of two who had been healthy full-term babies, and not subsequently hospitalized. In order to ensure some homogeneity of culture only white British children were chosen, and only those where the father was known to belong to the Registrar -General Social Classes III-V, i.e., skilled, semi-skilled and unskilled working classes.

TABLE 1. about here.

The proportion of skilled to unskilled workers amongst both fathers and mothers did not differ significantly from that reported in the 1961 Census for London and South East England (Table 1.) For practical reasons two further provisos were made; the mother must not work full-time, since our visits were made during the day, and there must be no older pre-school siblings i.e., three or four year olds, at home, since a pilot study had shown that assessment was impracticable with two children competing for attention. One third of the group were in fact only children, eight had a younger sib, and the rest had older siblings at school. Not all of the families approached initially by post took part in the study. Despite subsequent visiting most of the non-respondents could not be contacted, probably because the mother had gone to work or the family had moved away. Three refusals were obtained. The group is thus in no sense a sample, but may be considered illustrative of small well-functioning London working class families. Two of the fathers were unemployed, and the housing was often poor by English standards - nearly a half of the families had no access to a bathroom, more than half had only one bedroom, so that the children slept with their parents, and two families were living in condemned housing that was about to be demolished.

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The nursery environment.

The thirty nursery children were living in twenty-two different nurseries, which were however in many ways very similar. The number of children in each nursery varied from 14 - 41, but in only two cases were there more than 26 children. In all the nurseries babies under about twelve months were cared for in a separate baby unit, but from 12-months until the age of transfer to an older children's home, which varied from $4\frac{1}{2}$ - 7-years, they lived in mixed age "family" groups of six children. Each group had its own suite of bedroom, bathroom and living room, furnished in a homely style, and provided with a large number of books and toys. The ratio of child care staff (excluding cleaners, cooks and secretaries) to children varied from 1.06 to 0.58; at least two staff were on duty each day with each group of six children. In the less well staffed nurseries there were periods during the day when there was only one nurse in charge of six children; in the best staffed nurseries some of the children attended whole or half day school, so

that two staff would have only two or three children to care for during much of the day. All the children had their own clothes, and in most of the nurseries the staff on duty ate with the children.

Although staffing was generous, staff stability was poor. On average 24.37 (S.D. 5.52) nurses had worked for at least a week with each child during the course of two years. This was because all but two of the nurseries were training centres for nursery nurses. Almost all the nurseries had a very fixed routine, with meals, walks, bedtime at the same time every day, and in almost all the children received "block" treatment; that is they were got up, toiletted, and moved from room to room or into the garden as a group. In only two nurseries was a two year old allowed to leave the room unaccompanied by a nurse.

Assessment procedure.

All children were seen within two weeks of their second birthday, and equal proportions of home and nursery children were seen in each of the two weeks before and the two weeks following their birthday. All the children were assessed in their own living room, with their mother or most familiar nurse present. One experimenter visited 60% of the children, the other 40%. Each tested the same proportion of home and nursery children, and of boys and girls. Both experimenters were women.

1. Response to strangers.

For the first five minutes the child sat on his mother's or nurse's lap, whilst she chatted to the experimenter. The experimenter then made a series of standardised overtures to the child and rated his responses. The assessment scale was adapted for use with two year olds from one devised by Rheingold (Rheingold & Bayley, 1959) for younger children. First the experimenter turned to the child, smiled, and said "Hullo". Secondly, she opened a picture book and said, "Would you like to sit on my lap and look at it?" At each of these stages and also at the end of the initial five minutes chat, she rated the child's response to her on the following 7 point scale; 1 - cries or runs away, 2 - turns head away (definite avoidance) or clings to mother; 3 - sobers, stares solemly; 4 - no response, 5 - looks coy, or half-smiles / comes reluctantly with urging; 6 - definitely smiles / comes straight away without smiling; 7 - smiles and vocalises / approaches smiling. Possible scores thus ranged from 4 - 28. At the end of the interview the final two stages of this test were repeated. The rank order correlations between the scores of the two experimenters for each of the four stages, when interviewing a pilot sample of 20 children, ranged between $r = 0.92$ and $r = 0.96$, $p < .001$.

11. Response to separation.

The experimenter then asked the mother or nurse to leave the room briefly, with the door ajar. The child's response to this separation was then rated on the following four point scale; 1 - the child follows, looks miserable, 2 - the child follows, no emotion shown, 3 - the child stays, looks miserable,

4 - the child stays, no emotion shown. At the end of the interview the mother or nurse was again asked to leave the room, and the child's response was rated.

111. Test procedure.

After a few minutes further conversation the child was tested, sitting on his mother's or nurse's lap if he wished. Since no standardised intelligence test with a separate verbal and non-verbal scale and an adequate range was available for two year olds, the Cattell Infant Intelligence Scale was used. This scale contains both verbal and non-verbal items; since all the children were seen at the same age the number of verbal and non-verbal items passed by the two groups of children could be compared. The verbal and non-verbal scores were calculated by giving a score of one to each subject passed, beginning at the 12-month level. Before the investigation began, the experimenters who were familiar with other infant tests, practised the Cattell Scale in each other's presence on thirty children aged $1\frac{1}{2}$-$2\frac{1}{2}$-years, in order to achieve uniformity of procedure and scoring.

IV. Assessment of spontaneous language.

When testing was completed each child was given a box containing a variety of small attractive toys (a miniature tea-set, a family of small dolls, doll's furniture, toy soldiers, cars, a building pyramid, a picture book) and everything he said during the first ten minutes play was noted. The mother or nurse was asked to sit on the floor with the child, to make minimal verbal responses to him, but to interpret any remarks incomprehensible to the experimenter.

V. Assessment of experience.

The mother or nurse was then asked whether the child ever had certain experiences, and if so how often, and her answers were rated for frequency on a three or a five point scale. The experiences enquired of fell into three categories: watching T.V., being read to and sung to, and using certain play material such as large wheeled toys, pencils or crayons, water and sand, 2 - social experiences, such as visiting other houses and having a meal with another family, 3 - everyday aspects of the adult world, such as shopping, going in cars, buses, and cafés.

RESULTS 1. Intertester difference.

This was very small and not significant. The mean of the Mental Ages obtained by one experimenter was 23.65-months S.D. 2.92, (N = 36) and the mean obtained by the second was 23.77-months, S.D. 2.71, (N = 24) t = 0.15.

11. Response to strangers.

The children living at home were significantly more friendly than the nursery children. After the experimenter had been in the room for five minutes 86.7% of the home children approached her when invited, but only 50% of the nursery children. (χ^2 = 7.7, $p < .01$). 53.3% of the home children then climbed on her lap but only 26.7% of the nursery children (χ^2 = 4.44, $p < .05$). The mean score of the home children on the whole scale was 19.17, S.D. 4.09, and of the nursery children 15.63, S.D. 3.83, (t = 3.34, $p < .01$). Although wary, none of the nursery children showed marked fear until they were invited to sit on the experimenter's lap, when 20% of them cried and ran away. No home children did this. By the end of the session, when the invitation to approach the experimenter was repeated, the nursery children had become much bolder and 80% were willing to do so. However, whilst 30% of the home children approached eagerly on this occasion, none of the nursery children did so (χ^2 8.37, $p < .01$). Similarly, whilst 36.66% of the home children smiled and chatted as they climbed on the experimenter's lap at the second invitation, no nursery child did this cheerfully, (χ^2 = 27.80, $p < .001$) and two cried and ran away.

111. Response to separation.

When left alone with the experimenter six nursery children ran out of the room on the first occasion, but no home children did this (χ^2 4.63, $p < .05$). At the end of the session five nursery children were still unwilling to stay alone with the experimenter, but all the home children stayed cheerfully (χ^2 = 3.49, N.S.)

TABLE 11. about here.

1V. Cattell Infant Intelligence Test Scales.

Table 11 shows that there are no significant differences between the scores of boys and girls in either the home or the nursery group, or between the coloured and the white children in the nursery. However, the mean mental age of the nursery children was two months behind the norm, a very significant difference. Whilst most of the difference between the groups was in the verbal scores there was a small but significant difference also in the non-verbal scores. 20% of the nursery children (five boys and a girl) had no verbal successes above the twenty-month level. All of these children were reported by their nurses to use only a few words: a typical reported total vocabulary was "yes - no - please- ta - pot - bus".

None of the home children had such poorly developed language. 63.3% of the nursery children (ten boys and nine girls) had no verbal success above the twenty-two month level. 30% of the nursery children, but only 6.6% of the home children, were reported not to combine two words, nor were they heard to do so by the experimenters.

V. Spontaneous language.

All the children found the toys attractive: they usually spent the ten minute period examining and arranging them, and some home children, but no nursery children, engaged in fragmentory imaginative play, e.g., offering round "cups of tea".

TABLE 111. about here.

Table 111 shows that the home children vocalised (whether intelligibly or not) much more than the nursery children, and used a larger vocabulary. There was a big range in intelligibility in both groups and the difference between them was not significant. The difference in the mean sentence length of the two groups was also not significant if four nursery children who did not speak whilst playing or who used only unintelligible words were excluded from the comparison. The most frequently occuring utterance in both groups was the single word sentence, but the proportion of children using at least one sentence containing four words or more was much greater in the home group (one home child used several sentences containing twelve or more words). The six nursery children with very low verbal scores were either silent or used only a few single words during the ten minute period. However, because most of the nursery children, including those with the higher test scores, spoke so little there was relatively little material available with which to assess the level of their spontaneous language.

TABLE 1V. about here.

V1. Experiences.

Table 1V shows that the mean score of the nursery children for play experiences was higher, although not significantly so, than that of the home children. Nursery children were more often read to and sung to than home children, and more often played with sand, dough, paints and wheeled toys, However, the nursery children had significantly fewer neighbourhood social experiences and significantly fewer experiences of the adult world.

V11. Correlations between scores.

A product moment correlation of +0.37 [$p < .05$] was obtained between the Cattell mental age of the nursery children and their scores for breadth of experience. Within the group of home children the correlation was smaller and not significant [$r = +0.25$]. For the nursery children only, a significant product moment correlation was also obtained between the breadth of experience score and the Immediate Response to Strangers Score [$r = +0.55$, $p = < .01$]

the shyest nursery children tended to be found in the most limited environments.

For both groups of children, the correlations between the various cognitive test and language scores and the scores on the Response to **Strangers** and Response to Separation scales were very low and not significant. For the nursery children only, significant correlations were obtained between the verbal score on the Cattell test and the total vocabulary used in the free play situation [$r = +0.36$, $p < .05$] and between the Cattell Mental Age and this total vocabulary score [$r = +0.39$, $p < .05$].

Discussion.

The mean Cattell Mental Age of the nursery group was two months below the norm, and more than three months below the mean of the comparison group of working class children living at home. The inferiority of the nursery group was mainly due to their failures on the verbal sub-tests. For most of the nursery children the amount of retardation was less than has been reported in earlier studies. However, a fifth of the group, all but one of them boys, were reported to use only a half a dozen words. When playing with toys the nursery children talked much less than the home children, and only three of them were heard to use a sentence containing four or more words.

Three explanations for the inferiority of the nursery group must be considered. It is known that an undue proportion of their mothers are in semi-skilled or un-skilled occupations and it may be argued that their genetic potential is inferior to that of the contrast group. In the absence of information about parental I.Q.s this theory cannot be tested, but it seems unlikely that the verbal retardation of the nursery children can be attributed wholely or mainly to genetic factors, since their mean non-verbal score did not differ from Cattell's norm, and was only slightly lower than that of the home reared children.

Secondly, since it was shown that the nursery children, perhaps because of their limited experience, were as a group more shy than the home-reared children, it may be argued that their verbal retardation reflected an unwillingness rather than an inability to attempt the verbal sub-tests. The same doubt can be expressed about their inferior verbal performance when playing with a box of toys; possibly the nursery children were too ill at ease to talk freely. If this were the case, a significant correlation would be expected between their various language scores and their scores on the Response to Strangers and Response to Separation scales. In fact these correlations were very low and not significant, whilst significant correlations were obtained between the Cattell Scores and the total vocabulary used in the free play situation. These findings suggest that all the language scores reflected the children's verbal retardation, and that shyness was acting as an independent factor. Anecdotal support for this theory comes from the statement of the nurses that the children with the lowest verbal scores who spoke very little while playing had never been heard to use more than half a dozen words.

Thirdly, it amy be argued that the retardation of the nursery children is partly or wholly attributable to deficiences in their environment. Despite the great improvements made in recent years, the residential nursery considered as a language laboratory appears to be inferior to a 'good' working class home.

Three aspects of the nursery environment which were assessed in the present study may contribute to this inferiority. In all but the best staffed nurseries the adult:child ratio is lower than that of a small family unit, one nurse often having the care of six children for several hours each day. All of our home-reared children, whose mean mental age was above the norm, lived in an especially favourable environment where they were the only or the oldest pre-school child, and as such the main talking companion of their mothers. In these circumstances one would expect large differences in both the quantity and quality of talk directed at the two groups of children; a comparison of nursery children with the youngest children in closely-spaced families might well have shown less difference. Further, although the play material available to the nursery children was at least as good as that of the home children, their experience of the world outside the nursery was limited. This limitation of experience might be expected to narrow their vocabulary, and in fact a significant correlation between mental age and a breadth of experience score was found within the nursery group. Lastly, the fact that a large number of different staff care for the children may have implications for language development, not only because staff and child may have difficulties in understanding each other, but because their relationship may be too casual to encourage communication.

If these aspects of the nursery environment are indeed responsible for language impoverishment, then relatively unimpaired children, that is talkative children whose language development is at least average, should be found in the best staffed most stable nurseries which offer the widest range of experiences. In a subsequent study this hypothesis was directly tested, when relationships were sought between the mean level of language development of young children in 13 different nursery groups and such variables as the staff-child ratio, stability of staffing and breadth of experiences in the nurseries. [Tizard, Tizard, Mercer & Cooperman.]

Although two year olds in residential nurseries have been shown to be somewhat verbally retarded and fearful when compared with children living with both parents in a small stable working class home, it should be noted that in fact this alternative environment is not usually available for the nursery children. The real alternatives to residential care for most of these children were either living at a subsistance level in a single parent family, or growing up in a foster home. In subsequent studies we hope to look at the development of children in both these environments. Finally it should be noted that no necessary implications for later development can be drawn from a study of two year olds. Elsewhere, we have shown that the verbal achievement of nursery children changes between the ages of two and four and that this can be related to changes in th :r verbal environment. [Tizard, Tizard, Mercer & Cooperman.]

Table 1.

Social Class of Parents.

	II.	III.	IV,V.	Not known, or still at school.	£.
Home fathers	0	23	7	0	30
Home mothers	2	21	7	0	30
Nursery fathers	2	12	8	8	30
Nursery mothers	0	11	12	7	30

Table 11. Test Scores.

	Cattell Mental Age.			Cattell Verbal Score.		Cattell Non-Verbal Score.	
	N.	Mean.	S.D.	Mean.	S.D.	Mean.	S.D.
Home boys	15	25.68	3.15	13.47	3.29	22.87	2.90
Home girls	15	25.08	2.37	13.00	2.56	22.73	2.43
	t =	0.56	NS.	t =	0.41 NS.	t = 0.13	NS.
Nursery boys	15	21.72	2.45	7.66	3.39	21.2	2.53
Nursery girls	15	22.31	1.00	9.53	2.69	21.1	1.03
	t =	0.82	NS.	t =	1.90 NS.	t = 0.04	NS.
Coloured nursery children	10	22.40	1.90	8.90	2.51	21.70	1.42
White nursery children	20	21.82	2.32	8.45	3.0	20.80	2.07
	t =	0.79	NS.	t =	0.39 NS.	t = 1.20	NS.
All home children	30	25.38	2.76	13.23	2.91	22.80	2.63
All nursery children	30	22.01	1.89	8.60	2.81	21.10	1.90
	t =	5.43	p $<$ .001	t =	6.17 p $<$ .001	t = 2.82	p $<$ .01

Table 111.

Spontaneous Language.

		Home children. N = 30.	Nursery children N = 28.	χ^2	p
vocalised more than 50 times		50%	10.7%	8.69	< .01
vocalised less than ten times		6.6%	42.9%	8.48	< .01
% vocalisations unintelligble to mother or nurse	Mean	14.33	24.59		
		20.4	26.5		
20% or more of vocalisations unintelligible to mother or nurse		30%	48%	1.87	NS
Total vocalbulary used less than 20 words		30%	80%	13.68	< .001
Mean sentence length [4 nursery children who used no words excluded]		1.81 words	1.55	t = 1.45	NS
		0.64	0.19		
% of group using at least one sentence containing 4 or more words		46.7%	10.71%	7.38	< .01

Table 1V.

The children's experiences.

	Play Experiences.	Social Experiences.	Experiences of adult world.
Home children	36.7, 3.4	9.4, 1.5	12.9, 1.9
Nursery children	38.3, 3.7	4.5, 1.6	10.5, 1.8
t	1.7, NS	12.0, p < .001	4.9, p < .001

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